



STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
File: SDWB
Delao04.docx

June 16, 2020

Captain Marc R. Delao
Regional Engineer
Navy Region Hawaii
850 Ticonderoga St. STE 110
Joint Base Pearl Harbor Hickam, Hawaii 96860
[via marc.delao@navy.mil only]

Attention: CDR Darrel E. Frame
[via darrel.e.frame@navy.mil only]

Dear Captain Delao:

SUBJECT: Red Hill Shaft Drinking Water Sample Results and Analysis
Joint Base Pearl Harbor-Hickam (JBPHH) Public Water System (PWS 360)

The Hawaii Department of Health (DOH) has reviewed your June 12, 2020 letter with enclosure and Mr. Cory Waki's email sharing the NAVFAC HI Environmental Services Lab questions on the testing of drinking water samples after the pumps have restarted. The DOH responses are below in *blue italicized* font.

Before restarting the pumps, the Navy shall:

1. Provide scientific literature and/or studies to confirm the chemist's suggestions "that the results were due to disinfection byproducts from using chlorine as a disinfectant in our drinking water."
Response acknowledged. The DOH has additional questions which will be sent later. This does not hold up the restart of the pumps.
 - a. What changes to the chlorination process have occurred in the past 12-month period?
Response acknowledged that no chlorination process changes were made in the past 12 months and the Chicago lab will be used from here on out.
 - b. Have there been any other drinking water distribution process changes at Red Hill Monitoring Well (RHMW) 2254-01?
The DOH understands that due to a lead detection in the Fall of 2019, the piping at the Chlorination Building 287 was changed to PVC pipe and the SDWB regulatory sample point was relocated to the tap shown in the photo on page 3 of the Red Hill drinking water shaft sample points map and photos [PRIVILEGED; FOR OFFICIAL USE ONLY BY THE AOC PARTIES ONLY], undated. There have not been any other drinking water distribution process changes.

- c. Clarify whether the Sample 360-011 [Methods 524.2 (VOCs), 525.2 (SVOCs), 8015B (JP-8/F-24 and TPH-o), and 200.8 (Lead)] referenced as collected in March 2020 in the *Quarterly Release Response Report Red Hill Bulk Fuel Storage Facility, April 2020* (Quarter 1 Drinking Water Test Results) was actually the sample collected on 4/15/2020. *Response acknowledged that the March 2020 sample was not analyzed due to an incorrect sample container. The repeat sample for TPH was collected on 4/15/2020.*
 - d. Clarify that the “JBPHH Red Hill 356-011” cited throughout the *Eurofins Eaton Analytical Laboratory Report #483698CN*, dated 05/08/2020, should be corrected to “JBPHH Red Hill 360-011.”
Response acknowledged that the citation should be revised to reflect 360-011.
 - e. Clarify that there were four (4) samples collected and received (pages 9 & 11) for *APPL, Inc. Data Validatable Report, Report of Data: Case 92261*, dated June 1, 2020 (326 pages – Project: 60571032 CV18F0126 Red Hill Fuel Storage. HI). The cover letter indicates that only three (3) samples were received.
Response acknowledged that the additional sample was used for quality assurance (trip blank; ERH 1094).
 - f. Confirm the locations of the four (4) samples collected on 5/20/2020 (APPL, Inc. Case 92261 PDF page 11).
Response acknowledged that pre-chlorination sampling point PWS Sample ID 360-001 (hose bibb on pump apparatus) is not at the exact same location as RMHW 2254-01 (collected from within the shaft down the manhole). Laboratory Sample:
 - *ERH 1094 (post-chlorination collected at PWS 360-011 for Trip Blank)*
 - *ERH 1095 (post-chlorination collected at PWS 360-011)*
 - *ERH 1096 (post-chlorination collected at PWS 360-011)*
 - *ERH 1097 (pre-chlorination collected at PWS 360-001; vent of the pump)*
2. Provide a comparison of the chromatograph between the sample and the dissolved constituents of fresh fuel in contact with water. As the dissolved compounds weather, the chromatograph of a water sample will change dramatically. The fact that the sample does not fingerprint to fuel does not mean the parent compounds were not fuel-related hydrocarbons. A comparison of data and chromatograms for nonvolatile, dissolved organic compound (NVDOC) in samples from wells suspected to be impacted to data and chromatograms for unimpacted, background wells can help to better evaluate this issue.
Response acknowledged that Navy provided the requested comparison.
 3. Provide consumer messaging for DOH review and concurrence. We have enclosed a template which was based upon the February 5, 2014 DOH News Release No. 14-007.
Response acknowledged to include this in the annual consumer confidence report.
 4. Distribute DOH approved consumer messaging to PWS 360 JBPHH consumers.
Response acknowledged that the annual consumer confidence report will be issued at the end of June 2020.

5. Restart the pumps at a relative low pumping rate of 1.0 million gallons per day (MGD) for a period of 30 calendar days, unless otherwise directed by DOH. As of 9/24/2019, the flow reported by the Navy to the SDWB for the entire PWS 360 (Aiea-Halawa Shaft, Red Hill Shaft, and Waiawa Shaft) is 18.748 MGD. According to the Department of Land and Natural Resources, Commission on Water Resource Management, Island Water Use Permit Index, dated January 19, 2010, the allocation for the Navy's Red Hill Shaft is 4.659 MGD, the Aiea-Halawa Shaft is 0.697 MGD, and the Waiawa Shaft 14.977 MGD.
Response acknowledged. The restriction limiting Red Hill Shaft production capacity to 1.0 MGD is removed while the Navy continues to monitor and verify that TPH concentrations are not increasing in value.

After restarting the pumps, the Navy shall monitor and report:

1. At two (2) Sample Points.
 - a. PWS Sample ID 360-011, Tap Outside Chlorine Building (SDWB regulatory sample point; post-chlorination sample).
Tap as shown in the photo on page 3 of the Red Hill drinking water shaft sample points map and photos [PRIVILEGED; FOR OFFICIAL USE ONLY BY THE AOC PARTIES ONLY], undated.
 - b. PWS Sample ID 360-001, Red Hill Shaft Pumphead (SDWB regulatory sample point; pre-chlorination sample).
Tap as shown in the SDWIS System sample point 360-001.pdf file.
2. For the duration of the use of the Red Hill Shaft for drinking water purposes on the following frequencies:
 - a. Weekly for one (1) month after restarting the pumps.
Acknowledged that this will be challenging for Navy.
 - b. Monthly for (6-12 additional months).
 - c. Quarterly frequency, thereafter unless otherwise directed by DOH.
3. For the following parameters using the listed Test Method:
 - a. VOCs full scan (include chlorinated compounds, alcohols, aldehydes, ketones; Method EPA 524.2).
Clarified request is for full analyte list for the method specified. It is appropriate for the Navy to test for the chemicals listed in the scope of the methods specified (524.2) that could be found in fuels and their potential degradation products. We also want to look for halogenated compounds. If alcohols cannot be measured, include ketones and aldehydes if possible. Acetone is on the standard list for method 524.2.

- b. SVOCs full scan (include chlorinated compounds, alcohols, aldehydes, ketones; Method EPA 525.2).
Clarified request is for full analyte list for the method specified. It is appropriate for the Navy to test for the chemicals listed in the scope of the methods specified (525.2) that could be found in fuels and their potential degradation products.
- c. Gas Chromatography for JP-8/F-24 (Method EPA 8015, TPH-D).
The carbon range requested for quantitation is whichever is most appropriate for the specific site based on the fuel(s) stored there. Since the spill was JP-8, the Navy will provide the gas chromatography for TPH-d (C8-C18).
- d. Lead (Method EPA 200.8).
- e. Dissolved Organic Carbon (DOC) with volatile fraction purged NVDOC (SM Method 5310C).
Method 5310C (enclosed) is used to help quantify the concentration of hydrocarbon-related degradation compounds in groundwater. Method 5310C is preferred due to the lower detection levels (as low as 10 ug/L) in comparison to Method 5310B (as low as 100 ug/L). A minimum detection level of 100 ug/L is desirable for comparison to the EALs. Data for anticipated, background NVDOC in groundwater is recommended for comparison.

If you have any questions, please contact Ms. Joanna L. Seto, P.E., SDWB Engineering Program Manager, at 586-4258 or sdwb@doh.hawaii.gov.

Sincerely,



KEITH E. KAWOAKA, D. Env.
Deputy Director for Environmental Health

JS:js

Enclosure: STANDARD METHOD 5310C: Persulfate-UV or Heated-Persulfate Oxidation Method

- c: Mr. Cory Waki, NAVFAC Hawaii Pearl (w/encl.) [via cory.waki@navy.mil only]
Mr. Duane Morita, NAVFAC Hawaii Environmental Laboratory (w/encl.)
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Ms. Corine Li and Ms. Anna Yen, Drinking Water Section (WTR-4-1), EPA Region 9 Water Division (w/encl.) [via li.corine@epa.gov and yen.anna@epa.gov only]
Mr. Steven Linder, EPA Red Hill Project Coordinator, U.S. EPA Region 9 (w/encl.)
[via linder.steven@epa.gov only]
Ms. Lene Ichinotsubo and Ms. Roxanne Kwan, SHWB (w/encl.) [via email only]
Ms. Gabrielle Grange, Dr. Roger Brewer, and Dr. Iris van der Zander, HEER (w/encl.)
[via email only]

Captain Marc R. Delao
June 16, 2020
Enclosure

STANDARD METHOD 5310C: Persulfate-UV or Heated-Persulfate Oxidation Method

Method Summary

Method Source	Standard Methods
Method Number	5310C
Revision Information	Standard Methods Online
Descriptive Name:	Total organic carbon by Persulfate-UV or Heated-Persulfate Oxidation
Method Name	Official Name: Persulfate-UV or Heated-Persulfate Oxidation Method
Media Subcategory	WATER Organic
Citation	Standard Methods Online - Standard Methods for the Examination of Water and Wastewater
Brief Method Summary	Organic carbon is oxidized to CO ₂ by persulfate in the presence of heat or UV light. The CO ₂ produced may be purged from the sample, dried, and transformed with a carrier gas to a nondispersive infrared (NDIR) analyzer, or be coulometrically titrated, or be separated from the liquid stream by a membrane that allows the specific passage of CO ₂ to high-purity water where a change in conductivity is measured and related to the CO ₂ passing the membrane.
Scope And Application Applicable Conc Range	This method covers the determination of total organic carbon in surface waters, domestic and industrial wastes. 0.1 to 4000 mg/L
Interferences	Removal of carbonate and bicarbonate by acidification and purging with purified gas results in the loss of volatile organic substances.
QC Requirements	After every tenth analysis, analyze a blank and a laboratory sample prepared from a source of material other than the calibration standards, at a level similar to the analytical samples. Preferably prepare the laboratory control sample in a matrix similar to that of the samples. Alternatively, periodically make known additions to samples to ensure recovery from unknown matrices. If possible, rinse bottles with sample before filling and carry field blanks through sampling procedure to check for any contamination that may occur. Collect and store samples in glass bottles protected from sunlight and seal with TFE-backed septa. Before use, wash bottles with acid, seal with aluminum foil, and bake at 400°C for at least 1 h. Wash uncleaned TFE septa with detergent, rinse repeatedly with organic-free water, wrap in aluminum foil, and bake at 100°C for 1 h.
Sample Handling	If a sample contains gross particulates or insoluble matter, homogenize until a representative portion can be withdrawn through the syringe needle, autosampler tubing, or sample inlet system of continuous on-line monitor. If dissolved organic carbon is to be determined, filter sample and reagent water blank through 0.45-µm filter. To determine nonpurgeable organic carbon, transfer 15 to 30 mL sample to a flask or test tube and acidify to a pH of 2.
Max Holding Time	7 days. Analyze immediately, or refrigerate and add HCl, H ₃ PO ₄ , or H ₂ SO ₄ to pH < 2
Relative Cost/Effort	\$51 to \$200
Source	Standard Methods